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TECHNOLOGY AND SOCIAL NETWORKING DURING LECTURE

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TECHNOLOGY AND SOCIAL NETWORKING DURING LECTURE

TECHNOLOGY AND SOCIAL NETWORKING DURING LECTURE: THE
IMPLICATIONS ON WORK DISCIPLINE AND THE ORGANIZING OF WORK
PLACES IN THE FUTURE

By CAROL ELSTON-JACKSON, CHRP, B.A.

A Thesis Submitted to the School of Graduate Studies in Partial Fulfillment of the
Requirements for the Degree Master of Arts

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Abstract

This study examines issues arising from the popular use of technology and social networking in the classroom during lecture and its effect on student grades. Data were collected in a first year social science course. Findings of a general survey show that the use of technology and social networking during lecture is a popular form for multitasking with little impact on grades up to a certain threshold. Addressing this issue, this paper puts forth a broad historical overview of the use of leisure activities by workers during preindustrialization and industrialized capitalism. Through an examination of multitasking during lectures, this paper will assess the extent to which social norms of time discipline may be changing and the impacts this could have on the future of work organization. Activity theory is one method of guiding research in order to incorporate these multitasking activities into teaching and learning paradigms and policies for use in the classroom.

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I would like to thank my dad. My dad has always paid attention and listened to the words I've written or said. When I've hit a roadblock, he's always had a plan. He has helped me to create strong values that I carry forward in my heart. He is the one who understands my heart and is greatly responsible for helping me to build my character. He has taught me to be loyal to my family, friends, society and to my principles all at the same time. My dad reminds me that u-turns are designed to help us get back on track when we're heading in the wrong direction. His caring has shaped my life.

I would like to thank my closest friend and cheerleader; my partner, Gord Jackson. He is the only person who never has to consult his calendar to find time for me despite our very busy lives. Although the combining of two families is somewhat like rerouting a hurricane, our commitment to this is paramount and enhanced by the beauty and value of marrying the only individual you can't live without. Our dedication to one another was many years ago, but in a time when nothing is more certain than change, our celebrations continue today.

And to my father-in-law, who keeps up with my studies and who regularly reminds me about balance and to 'shut my motor off' and to 'take time to smell the flowers'. This paper represents my 'smelling of the flowers'.

It is for these reasons and so many more that I dedicate my thesis to them.

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Introduction

Advances in new media and telecommunication technologies are changing patterns of communication and social interaction (Horton and Wohl, 1956; Meyrowitz, 1985). The mobile phone has become one of the fastest-growing communication technologies ever, with subscriptions reaching over two billion worldwide (Wireless Intelligence, 2011). According to Meyrowitz (1985) “electronic media [has] led to the overlapping of many social spheres that were once distinct” (p. 5) thereby changing our social landscape through mobile communication practices. For example a private face to face conversation can be replaced by a conversation on the Smart phone or the personal computer in a public space such as a university classroom. In doing so, private space is made public.

When it comes to focusing and learning, the lure of technology is powerful for those who have grown up surrounded by digital technology and its constant stream of stimuli. Many today would argue that it is a distraction. Students have always faced distractions, and for some, this can become a problem when attempting to prioritize the information that is received. There are also implications for teaching instructors. Wei and Leung (1999) found classrooms to be among the least acceptable places for multitasking with technology such as Smart phones and personal computers. For the purpose of this paper, the word multitasking is defined as simultaneous performance of one or more leisure tasks while attending lecture.

From the literature and my own experience as a student and a teaching assistant, I have found a wide variety of multitasking in the classroom during lectures. In addition,

for as many multitasking options, there are as many or more methods for dealing with such distractions.

Although it may seem intuitive that participants, young people in particular, will report a negative perception about multitasking with various technologies and/or social media and attending their course lectures, the use of these technologies and/or social media while attending their lecture(s) has become increasingly popular. This indicates a possible disconnect between social norms and the appropriateness of when and where to engage in these leisure activities. Alternatively this is a possible return to pre-industrial multitasking, organic work patterns and a work culture which became extinct two and a half centuries ago with the onset of the industrial revolution. Through an examination of multitasking during lectures, this thesis will assess the extent to which social norms of time discipline may be changing and the impacts this could have on the future of work organization. This paper will seek to explore multitasking activities during lecture, time discipline and student grades by drawing on the following:

- a historical perspective on multitasking and work and the introduction of time discipline into early factories
- current pedagogical thinking about teaching and learning and
- Yrjo Engestrom's activity theory

Preindustrial Era

When one considers how people worked in the preindustrial era there was a period in which leisure diversions and work were mutually constituted. Just as labour during this period often involved autonomous and collective regulation by the workforce, so too were the activities within work such as unscheduled breaks and talking and singing on the job. According to research on occupational identity and leisure activities occurring

simultaneously within the context of labour in the preindustrial era (Thompson, E.P., 1967; Elbourne, 1908; Palmer, 1986; Pickering, 1982; Thompson, F., 1954; Clayre, 1974; Lloyd, 1967; Hugill, 1961; Proctor, 1992; Porter, 1995; Campbell, 2006; Richards and Stubbs (Eds.), 1979) multitasking at work was commonplace among a number of the most populous occupations such as weavers, agricultural labourers, driver's of horses, cattle and wagons, miners, sailors, hawkers, cobblers, tailors, those employed in tweed wauling [a finishing process applied to woven material], and those undertaking domestic labour.

Activities such as singing to set the pace and time of work, or composing poetry to the rhythm of the loom that occurred simultaneously with the primary work task(s), were constituted in relation to the necessities of labour. These activities occurred most often in collective settings in which the element of individual autonomy, specifically regarding choice, was minimal (Marrus, 1974, p 5-8). Labour was difficult, physically taxing and often repetitive, and the ability to multitask with other activities afforded people transport and the experience of transcending beyond the material conditions of the work in which they were placed. Conceivably the rhythm and pace of leisure activities such as singing, informed the rhythm and pace of the production process itself. In short, workers were labouring in a multitasking environment of their own making.

Evidence supporting the need for workers to blend work and leisure time was clear in the suggestion that leisure time within the work setting was haunted by the imperatives of a rigid work discipline. As the Saturday Review pointed out:

The result of the man's whole mode of life, the almost instinctive disposition to proceed methodically in the laying out of one's time...may prove fatal to the enjoyment of leisure. People trained to habits of order

and punctuality, and to the most scrupulous employment of every moment are not fitted for the easy careless attitude of leisure (1866, p.714-715).

Indeed, a common observation that can be made is that leisure can be lost to the pervasive, extrinsic necessity to conform to the customs and expectations of work-time. Therefore, multitasking in the form of song or a poem [a leisure diversion simultaneously occurring alongside labour] served to overcome the tedium of the labour and occurred as part of a cultural consolation or form of escapism within the time structure of the workplace. According to Clayre (1974), the fusion of work and leisure contained a possible

alternative ideal in working people's own inherited consciousness, both to the routine hand-labour of farms...and even to ideals of craftsmanship, serious productive labour and intrinsic satisfaction in work itself (p. 147).

Given the functional role that multitasking played in the workplace during this era, it is appropriate to consider whether singing or whistling or humming or writing poetry was also a work tool. Just as other self-created tools were required (workbench, awl, hammer), so too was cultural identity and voice, tools of production and occupational identity in the pre-industrial labour process. In addition to the voice used as a 'tool for leisure' on the job, song acted as voice in the articulation of grievances and workers' interests.

Although labour was often free from direct supervision, Scholes (1970) noted that in addition to creating a leisurely diversion from the perils of work, voice through song allowed for crewmen, for example, to air their tribulations about the way the ship was being managed (p. 947). This signified for the boss who was hearing this collective voice to perhaps think twice before challenging the work effort of his employees. Singing and song represented as much a part of worker's cultural consolation and a form of escapism

as their collective voice on the job. This offered the worker a powerful and autonomous tool which was to temporarily use a melodious function to air his/her grievances, remove the worker from the material demands of production, while simultaneously carrying out the work tasks.

Industrial Era

As diversions such as music and poetry informed worker's experience on the job during the preindustrial era, it is useful to consider a distinction between preindustrialization and industrialization. In the preindustrial era workers used pleasure or leisure activities through and within the hardship of work. During this time the combining of play and work was to be systematically undermined with the onset of industrial capitalism. Andrew (1999) refers to the maxim "work when you work and play when you play" (p. 13) used by both Frederick Taylor and Henry Ford to account for the severe disentanglement that separated leisure as a form of multitasking which had been central to work in the preindustrial era. Music was no longer a work tool, but clearly consigned to the 'play' portion of this new time ordering of industrial capitalism.

Although many choirs were based around the workplace in the industrial capitalist era, to understand the nature of the death of leisure time and work occurring simultaneously, it is necessary to understand the changes that occurred within the labour process itself. First, there was less of an autonomous pacing of work, and, second work was appropriated by managers typically stressing the need for full and active commitment from the workforce and a complete dedication of one's time to the labour process.

Although machine pacing gave management the ability to control the pace of work, management control was not total control and workers could still resist. Lewchuk (2011) who spent time as a production line worker at Ford recalls

It was common [for workers] to do things other than line work. Many read, I read 100 pages a day on the line. Others played chess, listened to the radio, and on special occasions, TVs were brought in to watch hockey games (2011).

This afforded workers the opportunity to incorporate some leisure time into the work day. However, this was not necessarily a welcomed activity. According to Lewchuk,

This often created tension with supervisors who tried to minimize these sorts of diversions, or [alternatively] use them as bargaining chips to reward workers who self-disciplined in other ways (2011).

The combination of leisure time and the labour process in the pre-industrialized era was replaced by the machine-pacing of work in the industrial capitalist era. This had a crucial impact on multitasking in the workplace as the new industrial machines set the pace of the work process. Industrial machines usurped much of the major pacing function that song, humming and poetry-reading previously provided in the mutually constituted relationship between leisure time and work of the preindustrial era.

Beynon (1973) and Goodrich (1975) argue that the political process of setting the pace of production was removed from the worker and placed in the control of managers in order to speed up the pace previously set by the slower rhythms set by songs. For example, Hammond and Hammond (1995) found that “spinners in the early factories would be fined one shilling for whistling at work” (p. 20). Scannell and Cardiff’s (1991) study of broadcasting and Elbourne’s (1908) study of music suggests that “new discipline measures erupted which could forbid singing or even whistling at work” (p. 353/p.60). Clayre (1974) argues that “with the advent of industrial capitalism, play and singing, even

talking, were to be stamped out” (p. 100). This was in essence, a conscious attempt to eradicate leisure-time habits that would affect the new coordinated pace of work.

Clayre (1974) makes the case that “the robbing of rituals [such as song and poetry] from work constituted the worst act of destruction of industrial capitalism, contributing to a perception among people that the quality of life had deteriorated” (p. 101). To understand further the nature of social/leisure multitasking at work and the movement from the inclusion of leisure time at work to the rise of mono-tasking in an unfree workplace, it is necessary to examine leisure-time and its transition from “tool” to distracter and the new industrial workplace which encouraged passivity among the workforce.

During the industrial era, management’s power over the control of production went well beyond the prohibition against ‘non-work’ and leisure during the workday. Thompson (1991) notes that at the “Crawley Iron Works, the employer stipulated that the length of the work-day be calculated after deductions for...playing...and singing” (p. 382). This meant, at its most extreme, a control over workplace silence as was the case in the early factories. Just as Lewchuk (2011) adapted his work day to incorporate leisure activities while on the line, Corbett (1994) indicates that in general, workers adapted to these controls by talking to one another using minimal lip movement so as to avoid detection by their supervisors. However, Taylorism soon repressed any possibility of combining social and leisure activities with the labour process.

In order to fulfill management functions, the new alienated work methodology was arranged by profit-driven capitalist bosses into a Taylorized system of scientific management as a method of creating surplus value. Work tasks were broken down into

mono-tasking systems that were quota-based offering little intrinsic value to workers. Capitalists' visions included standardizing the physical tools such as machines, and leisure tools such as singing, humming, and poetry writing/reading were almost wiped out. The ability to multitask leisure activities with work was replaced by capitalist workplace ideologies such as physical, meaningless, motions of the body rather than a combination of actions that included both physical and mental engagements. The new process meant that 'unproductive' leisure time activities were replaced by 'purposeful' work.

In order to adjust the worker to 'productive' or 'purposeful' activity under industrialization, Braverman (1974) argues that surplus production must be expanded and the worker deskilled. Specifically in Braverman's view,

workers would thwart efforts to realize to the full potential inherent in their labour power, unless control of the labour process passed into the hands of management, not only in a formal sense, but by the control and direction of each step of the process, including its mode of performance (p. 100).

Henceforth, production and the conceptual control of time and production were shifted to capitalists.

During the industrialization era capitalists embraced scientific management as a method to alienate the worker by separating mental from manual labour. As work was forcibly separated from the means of production by the inhumanity of capital, the traditional sources of leisure-time during work and worker autonomy inherent in the pre-industrial era were undermined.

In Braverman's deskilling argument, the tendencies of deskilled work entailed a severe restructuring of working habits, new time disciplines and incentives creating a new

human nature; however, this implies that humanity could be restored by the reconnection of mental and manual labour, in short, the abolishment of capital itself. In pre-industrialization, leisure-time and work were mutually constituted to a significant degree. The use of leisure-time during the work process allowed a transport from the material demands of the production process while at the same time participating in these demands. Capitalist industrialization saw the pace of work become more controlled by the employer and the work process not compromised. This internalized industrial work ethic has been enshrined into the modern educational system.

Current Pedagogy on Teaching and Learning

The notation of time which arises in such contexts as “work” and “life” in a preindustrial era has been described as task-orientation by E.P. Thompson (1967). Task orientation is the notion of time which arises in such contexts as “natural” [for example less ordered or controlled] or the opposite of “timed labour” (Thompson, 1967, p. 60). When workers or students are task oriented, they relate the measurement of time to naturally occurring cycles. For example, the time it takes to complete their work while setting aside the artificial units such as the minutes, hours and days of clock time. When employers began to orient work around the utilization of clocks, this allowed for the measuring of labour inputs where effort was bought and sold and time was no longer passed and leisure incorporated, but spent, bargained or budgeted. School, like work is organized around this form of time orientation when perhaps incorporating a more task oriented method of teaching and learning would benefit students much better.

This section of the paper will discuss current pedagogy on teaching and learning and will focus on the learning paradigm as a method of instruction as well as one of

Thompson's ideas about task-orientation. Thompson (1967) proposes three points about task-orientation; however this section will focus primarily on Thompson's second point which is "a community in which task-orientation is common appears to show least demarcation between "work" and "life" (p. 60). Thompson (1967) argues that where "social intercourse and labour are intermingled...there is no great sense of conflict between labour and "passing the time of day" (p. 60). This statement plays out in the power-structured higher educational system of modern societies where students are intensifying their efforts to multitask with technology in the classroom. According to Chickering and Gamson (1987), good practice in the classroom:

1. Encourages student/faculty contact
2. Develops reciprocity and cooperation among students
3. Uses active learning techniques
4. Gives prompt feedback
5. Emphasizes time on task
6. Communicates high expectations
7. Respects diverse talents and ways of learning (p. 1)

In addition, scholars on learning suggest that just as the learning environment is complex, learning itself is complex. Learning lasts beyond school-age and into adult life. According to Oblinger (2010), in the 21st century, learning,

is a complex blend of skills, competencies and the will to continue learning through life. These skills and competencies include the ability to think critically and solve complex problems, work collaboratively, communicate effectively and pursue self-directed learning or metacognition (p. 4).

In a university setting, students attend, are instructed, perform their school-work and are now beginning to multitask and incorporate leisure activities with Smart phones and personal computers while attending lectures. Students have always faced distractions and time-wasters, however, modern day technology in the classroom such as Smart phones and personal computers, and the constant stream of social stimuli they provide,

pose a challenge for instructors when it comes to the traditional pedagogical issues of teaching, learning and focusing. As Guskin points out in his article premised on teaching and learning,

The primary learning environment for undergraduate students, the fairly passive lecture format where faculty talk and most students listen, is contrary to almost every principle of optimal settings for student learning (p. 20).

Thus, mono-tasking, an unpopular work structure during the industrial era, has the same effect once translated into a learning paradigm in a traditional university setting.

Therefore mono-tasking in a traditional lecture setting does not necessarily produce more learning (the reason for attending a higher learning institution in the first place), but creates a system increasingly constrained by time spent multitasking with schoolwork versus and/or leisure activities.

Student learning is very complex. In an era where students are distracted with wired and wireless diversions, it is not uncommon for them to send hundreds of text messages a day or spend hours on Facebook. Therefore, in many classrooms it has become difficult for instructors to take back student's attention from their Smart phones and computers. However, according to Barr and Tagg (1995), in a learning paradigm,

A college's purpose is not to transfer knowledge but to create environments and experiences that bring students to discover and construct knowledge for themselves, to make students members of communities of learners that make discoveries and solve problems (p. 15).

Therefore, one could argue that the students are empowering themselves and creating an ever more powerful learning environment that includes multitasking with leisure activities while "at work". This is consistent with Thompson's theory where social intercourse and work occur simultaneously (in the form of multitasking) in the classroom

and where the demarcation between work and leisure is dissolved, thus creating less conflict in the system itself.

According to Barr and Tagg (1995), educators may scoff at the use of the word ‘production’ in the context of teaching and learning (p. 15); however, there are parallels between the production of learning in a university setting and production in the workplace. In an academic setting such as an undergraduate class, “the mission of the college is to produce learning; the method and the product are separate” (Barr and Tagg, 1995, p.15). Therefore, if traditional methods of instruction such as professorial lecturing are replaced by learning paradigms that involve the students, who take co-responsibility for their learning, then both agents (university and student) are more equal in terms of the control of the learning. Similarly workers in today’s industrial workplace long for the autonomy enjoyed in the preindustrial work era.

Therefore, like the preindustrial workplace, a simple shift in the learning paradigm makes it possible for a potentially significant improvement in productivity. Sharing the control of production has the potential to create positive results particularly where work and leisure are co-existing and workers [the students] are not being deskilled and separated from the means of production. This was a similar case during the move from pre-industrialization to industrialization.

For years, the same values that have been instilled in the modern industrial workplace have been inculcated in a production-oriented educational system thus resulting in a mono-tasking work-ethic internalized by students. For example, students are expected to be punctual, take lecture notes, sit for long periods of time, listen and be attentive at all times and remain quiet and orderly while the instructor is speaking. As

such, there is little question that in an environment such as a traditional learning institution, Smart phones and personal computers are becoming scourges.

Educators wrestle with consensus on policy options for banning the technology that creates ‘uncivil behaviour’ and multitasking distractions. Indeed, one should consider that perhaps students are reverting back to Thompson’s notion of intermingling work and play in a multitasking work culture in order to pass time. Moreover this move would also create a work environment that meets the criteria set out by Oblinger, Chickering and Gamson and Guskin; conceivably a ‘workplace’ similar to that of the preindustrial era.

Issues in the Classroom

Integrating multitasking into a lecture setting is fraught with disruptions and opportunities. Barnard’s (1938) argument as applied to organizations and Engestrom, Miettinen and Punamaki’s (1999) theory about activities support the case for the enabling of students to multitask in the classroom while minimizing the so-called ‘distracting’ effects caused by Smart phones, computers and social media. Barnard’s and Engestrom’s theories will inform the following discussion on approaches that universities have taken to control the distraction and disruption during lecture.

In his book titled *The Functions of the Executive* Chester Barnard (1938), argued that organizations are essentially cooperative systems, integrating the contributions of their individual participants. Implicit in this argument are two ideas: the first is that participants must be induced to contribute and the second is that efforts must be directed toward a common purpose (p. 3-21). Essential for this process was the creation and allocation of satisfaction among individuals. Further explanation for social behaviour within organizations is provided by activity theory, a model developed by Vygotsky, Leont’ev and Luria and reformulated by Yrjo Engestrom et al (1999).

Activity Theory and Methods of Technological Integration in the Classroom

Incidents of control in the classroom are likely to increase as the newest models of Smart phones become more and more like little computers in offering ease of use due to their smaller size and the potential for ‘inappropriate’ screen time similar to a laptop. Incorporating multitasking with technology into the learning paradigm is a social function mediated by a tool (e.g. laptop, blackberry) by which diversions occur as a result of multitasking leisure activities occurring simultaneously with lectures. Multitasking with leisure activities such as computers and social media therefore creates opportunities to change the current system of learning because, according to Murphy and Rodriguez-Manzanares (2008), “innovations [such as incorporating multitasking/leisure activities] are the engine of change” (p. 443). Therefore, activity theory can provide insights into new teacher practices in order to restructure the learning paradigm to incorporate students’ multitasking initiatives as instructors’ tools.

The lens of activity theory (AT) helps explain how social action is mediated by social organization, by primary and secondary social artifacts, or tools such as laptops. Engestrom’s theory contains three interacting entities: the subject or individual, the object and the community (see figure 1).

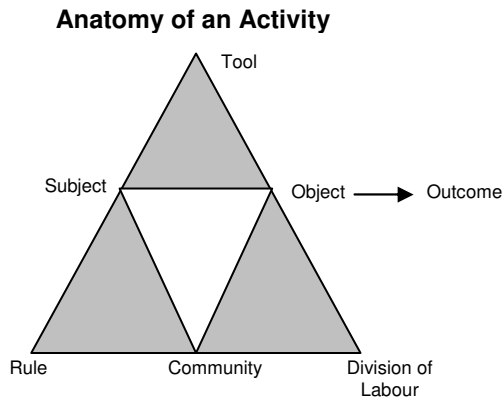


Fig. 1: Engeström's Activity Theory (Engeström et al., 1999, p.31)

The above model of the structure of activity was formulated by Engeström (1987) and includes six related elements: subject, object, community, rules, tools, and division of labour. They are described more fully as follows:

- The *subject* of an activity system is the “individual or group whose viewpoint is adopted” (Murphy and Rodriguez-Manzanares, 2008, p.443). In the case of this paper, the student is the subject.
- *Object* “refers to the ‘raw material’ or ‘problem space’ at which the activity is directed and which is molded or transformed into outcomes with the help of physical and symbolic, external and internal tools” (Engeström, 1993, p.67). It precedes and motivates activity. For example a new teaching paradigm.
- *Community* refers to the ‘participants of an activity system, who share the same object’ (Murphy and Rodriguez-Manzanares, 2008, p.443). In this case, the class is the community.
- *Rules* are “explicit and implicit norms that regulate actions and interactions within the system” (Engeström, 1993; Kuutti, 1996). Rules are simply boundaries to ensure all parties are aware of the expectations.
- *Tools* “mediate the object or activity. They can be external, material (computer) or internal, symbolic (language). Tools take part in the transformation of the object into an outcome, which can be desired or unexpected. They can enable or constrain activity” (Murphy and Rodriguez-Manzanares, 2008, p.443). In this case, an application to restrict the use of the internet in the lecture room could also be considered a tool.

- The *division of labour* “involves the division of tasks and roles among members of the community and the division of power and status” (Murphy and Rodriguez-Manzanares, 2008, p.443). For the purposes of this paper an example of division of labour is a learning paradigm with roles designed for all parties in order to participate in the ‘production’ of learning.

Activity theory therefore can be applicable as a positive enhancement to improve a tool-mediated activity such as the use of technology/social media for leisure by students during lecture. Much of the focus on controlling the diversions in the classroom has been to restrict the tool(s), for example, banning the use of laptops or penalizing students whose cell phones ring during lecture or confiscating the Smart phone or in the case of the industrial workplace, fining workers for singing or humming.

Instead, instructors could focus on other components of the model such as subject, object, division of labour, rules or community in order to permit the use of computers during lecture. This would allow instructors to adopt new learning paradigms similar to those of a pre-industrial era, where subjects (workers or students) had some autonomy over their leisure tasks/activities while at the same time being productive. Alternatively instructors could incorporate the tools and adopt Gamson and Chickering’s good practices for teaching and learning. Suggestions and recommendations that would allow for this type of change while ‘controlling’ the distractions (the tool), follow in the solutions section of this paper.

Without question we have left a time when brawn and physical skills were the norm of the pre- and postindustrial eras and have entered the knowledge era. The Kaiser Family Foundation recently released a study that found the average young American spends more than seven hours a day using some type of electronic device (Kaiser, 2010).

Technological advances have allowed us to be connected instantly and constantly to attention-grabbing streams of information in a global world. In today's universities with ubiquitous wireless connections, technology integration can offer usefulness in mobile learning environments. However, there are also the unwanted and distracting side effects.

The social uses of Smart phones and personal computers in public places such as classrooms are widespread. Smart phones, for example, are distracting because of ringing and use for cheating, texting and multitasking (Campbell, 2006, p. 281). In addition, some Smart phones come with cameras and recording devices that present problems of improper use of context and privacy (see articles on Jay Bennish, who was fired and reinstated due to his lectures that were recorded and posted online and out of context by a student taking his course).

Laptops in the classroom present physical barriers between professors and students while the use of Smart phones and laptops for Facebook updates, texting and game playing, present distractions for the user and other students in the classroom. Complaints about these private publicized activities are often ignored because within the university there is little consensus as what should be appropriate boundaries. The question becomes, what is driving this behaviour and what is to gain from interfacing with objects rather than people?

Just as there are methods used to control multitasking in the industrial workplace, there is also a wide spectrum of methods used to control multitasking in the classroom. However, as Ishii (1996) argues, little is known about users from a sociological or psychological viewpoint since previous research has examined cellular phone and computer use from a technological perspective. Thus, control methods focus on the

instrument or tool rather than the pupil or subject and range from restrictive practices such as the outright banning of electronic devices and wireless connections, to practices that incorporate the devices into pedagogical paradigms that Barr and Tagg (1995) refer to as “producing learning with every student by whatever means work best” (p. 13).

Methods of Technological Restriction in the Classroom

Many instructors ban the use of Smart phones and laptops in the classroom due to the potential for disruption and distraction; however, this is challenging when dealing with students who require accommodations for disabilities. For example, at Fordham University’s law Library, the answering of Smart phones is prohibited everywhere, including the stairwells (Fordham University School of law –Leo T. Kissam Memorial Library, 2011). This could present a problem during rare but legitimate emergencies. In cases where students are unable to take notes, laptops often act as a tool to allow those with disabilities to participate in this task. Moreover, student note-takers are requested by the school and paid via bursary to provide electronic lecture notes for Centres for Student Development in order to accommodate various disabilities such as blindness (McMaster University, 2011). This measure of banning laptops will penalize students who require computers to obtain an education.

Another method often used in the classroom is controlling the wireless connections. This allows students to use the computer for little other than taking lecture notes. For example, Saul Levmore, Dean of the University of Chicago Law School, eliminated internet access in the classroom because “students may overestimate their ability to multitask during class” (University of Chicago News, 2008). Moreover Levmore further stated that:

We need to think of internet business as inappropriate in the classroom, much as everyone recognizes the need to shut off Smart phones and to refrain from ostentatious newspaper reading in class or at business meetings (University of Chicago News, 2008).

And finally Levmore claimed that

As soon as we discovered that we had the capacity to turn off Internet access during class time, we felt that we ought to move in that direction. Our goal is to provide the best legal educational experience in the country, with students and faculty focused on the exchange of ideas in a thorough, engaging manner (University of Chicago News, 2008).

If one agrees with Oblinger's definition of learning, and if Tagg and Barr's learning paradigms described above are considered accurate, then this type of control of production hinders the student's ability to 'produce'. In addition, this method of control would eliminate the ability for non-traditional students to learn outside the classroom from a virtual conferencing mechanism such as a satellite classroom. Moreover, leading edge instruction methods such as video conferencing would make alternative teaching methods 'virtually' impossible.

A third method of control confiscation is unduly restrictive and unnecessary. Although instructors may wish to control limits, requiring students to turn off the device should be sufficient. Confrontational or restrictive controls may hurt student-instructor relations or harm instructor reputations. Prohibitive approaches send the message to students that instructors are fully responsible for the learning in the classroom, and, according to Barr and Tagg (1995), optimum learning takes place when both parties are co-responsible for the production [in this case, learning]. Finally, a restrictive approach contravenes Barnard's theory whereby both parties [student and instructor] are satisfied and the efforts of both parties must be directed towards a common goal.

The Study

As discussed, incorporating leisure into the workplace has been a common diversion for workers. Internal and external distractions have offered the worker an attractive diversion from the mundane pace of the industrial workplace. The classroom is another place of work where diversions occur. During lecture some students of the past have simultaneously looked out windows, daydreamed, doodled, passed notes and whispered to friends. However, wired/wireless electronics such as laptops and Smart phones and the distractions they offer appear to be more of an obvious distraction in the classroom, often competing with professors for student attention.

To address the concerns about student use of technology during lecture, this paper draws on a quantitative study of the relationship between multitasking with leisure activities such as technology/social media during lecture and student grades among those taking a first year social science course. The grades used in the survey are as follows:

1. Final grade in the target course as provided by the professor and
2. self-reported high school average grade in the student's final year of high school

Participants

There were 305 students registered in the target course; however, on survey day 72 students were present. Sixty-six individuals participated in this study (fig. 2: 52% female, 48% male). All participants were students from a variety of academic disciplines at McMaster University (fig. 3). Among the population 53% (60% female, 40% male) were taking lecture notes on a computer. Of the females in the study 58% took lecture notes using a laptop computer and 47% of the males surveyed took lecture notes using a

laptop computer. Therefore, this indicates that although the number of males and females in the study were close to even, a greater number of females use laptops to take lecture notes.

When asked about multitasking 91% of the participants claimed to have multitasked at least once during lecture with either a form of social media and/or an electronic device such as a Smart phone or personal computer. Sixty-three participants (49% female, 51% male) reported using social media at least one hour per week and on average reported missing three to five hours of lectures for the target course after nine weeks of class. The median for the question asking the participants to estimate their family's gross annual household income was reported at \$75,000 to \$99,999. The mean age for the sample was 19.5 years and 82% of the participants were in their first year of their undergraduate degree.

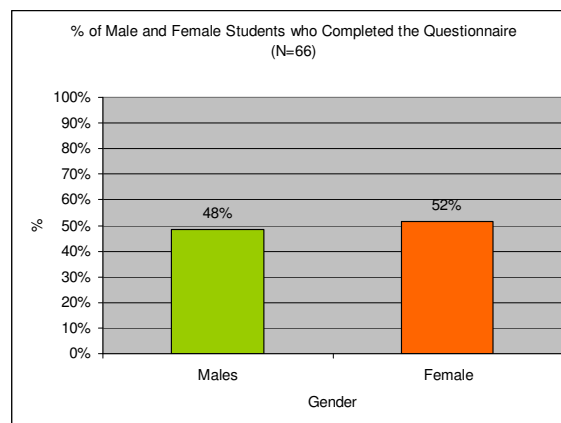


Fig. 2

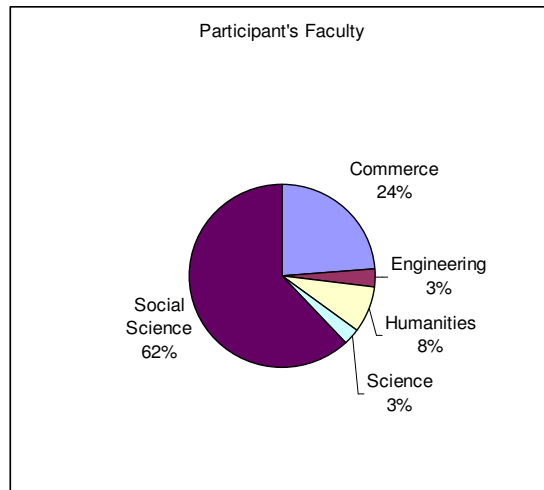


Fig. 3

Method

Paper surveys were distributed and used to assess participant multitasking habits during lecture in a university classroom. Surveys were administered during an introductory undergraduate course in Labour Studies. The data were collected in this particular course due to the variety of students who enroll in a first year social science course, moreover only one professor responded to the invitation to have their class participate in the study. Of the 72 students solicited to participate, 66 agreed to participate, resulting in a 92% response rate. Surveys took about 15 minutes to complete on average. All participants received an informed consent form notifying them that participation was voluntary and confidential. Data were collected during the 2010-2011 academic year in March 2011 of term II. Prior to data collection, the researcher received permission to conduct the study from the university's ethics review board.

Research Instrument

An original self-report survey containing 16 questions was used to gather demographic information and to assess attitudes and habits about multitasking activities with electronic devices (e.g. computers and Smart phones) and social media (e.g.

Facebook, Twitter) during lecture. The attitudinal items were loosely grounded in the literature reviewed above with particular focus on Yrjo Engestrom's *Activity Theory* as a tool to interpret the findings and suggest alternative methods of incorporating rather than banning these devices from classrooms. For demographic items, participants were prompted either to circle a response from a list provided (e.g. male/female) or to write in a response (e.g. their age). For the items specifically related to the multitasking activities, participants were asked to respond using a four point scale with response options for use of technology during lecture ranging from *never* to *always*.

Considerations were given to the various methods of surveying the participants and due to costs, time and data sensitivity, a paper and pen survey was decided upon. By way of students' marks falling under various privacy rules with the university, it was important to be sure that enough students and professors would agree to participate. Therefore a paper survey which is easily shredded once the survey is complete was used in order to administer the survey.

Results

Multitasking Habits while Attending Lecture

Participants generally reported that they multitasked during lecture (Fig. 4). Those who multitask during lecture represent 89% of the participants. As shown in figures 5 through 7, participants in the study reported that they used technology (e.g. laptops or Smart phones) during lecture *once in a while; often; or all the time* for one or more of the following activities: texting, social networking, surfing the internet, playing video games.

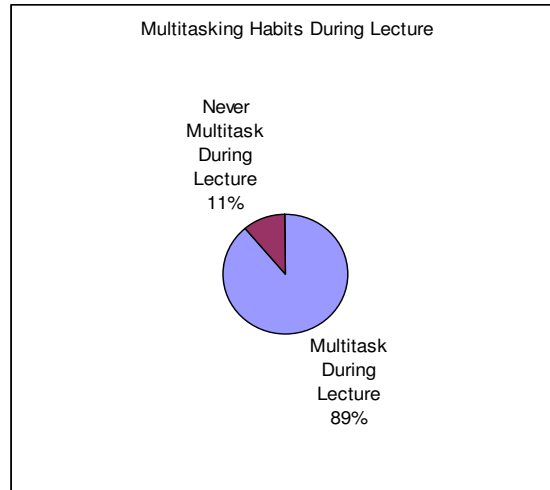


Fig. 4

Participants were asked to report their multitasking habits during lecture on a scale as follows: *never*, *once in a while*, *often* or *all the time*. Figure 5 shows the breakdown between males and females for those who reported multitasking either *often* or *all the time*.

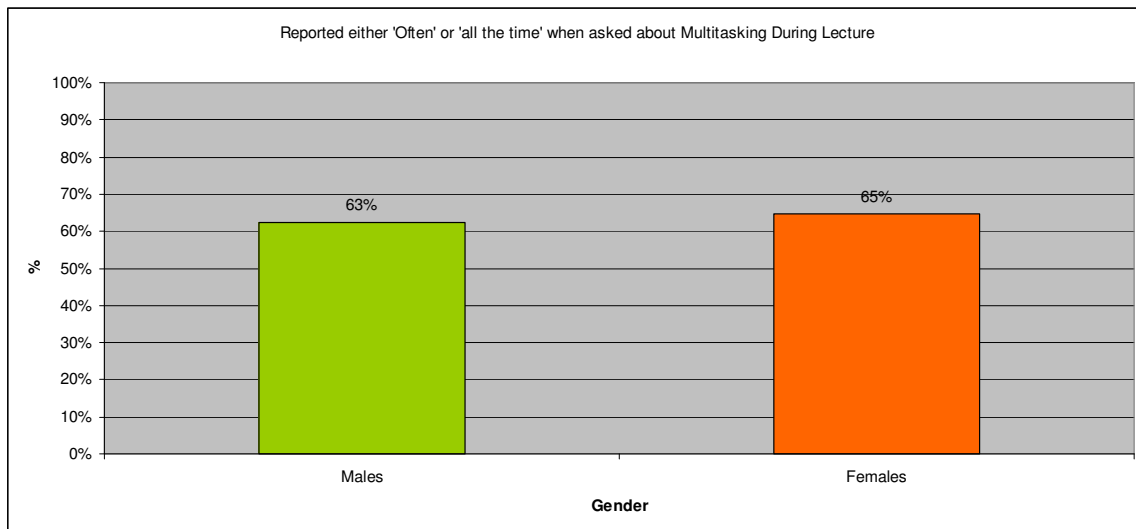


Fig. 5

Figure six describes the participants' texting habits during lecture. Texting requires the use of a Smart phone and occurs most often with both hands. Texters are required to read and respond to short exchanges with one person at a time. Texters represent 83% of

the study's population. During lecture 84% of males are texting and 82% of females are texting (fig. 6).

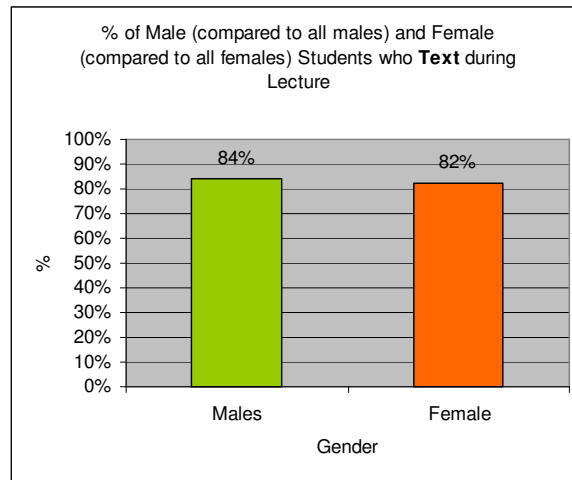


Fig. 6

Figure seven describes the participant's social networking (Facebook, Instant Messenger, Twitter) habits during lecture. Using a social network requires the use of a Smart phone and/or computer. Social networking occurs most often with the use of both hands typing. The user is required to send and read messages, view photos, comment on visual cues and this activity often occurs simultaneously with one or more than one person. Social networkers represent 62% of the study's population. During lecture 56% of males are social networking and 68% of females are social networking (fig. 7). There is a significant difference between males and females social networking working habits during lecture. Twelve percent more females than males use social networking as a diversion during lecture.

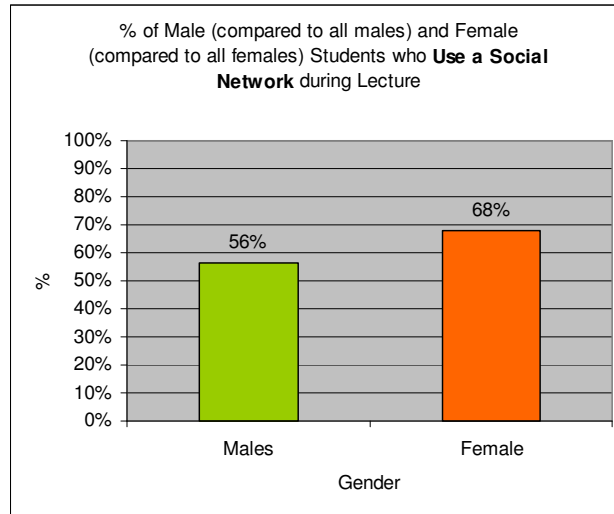


Fig. 7

Figure eight describes the participant's internet surfing habits during lecture. Using the internet requires the use of a Smart phone and/or computer. Internet surfing occurs most often with one or both hands typing. The user is required to type and click on various web links and read information that appears on the screen after their search. Internet surfers represent 61% of the study's population. During lecture 59% of males are surfing the net and 62% females are surfing the net (fig. 8).

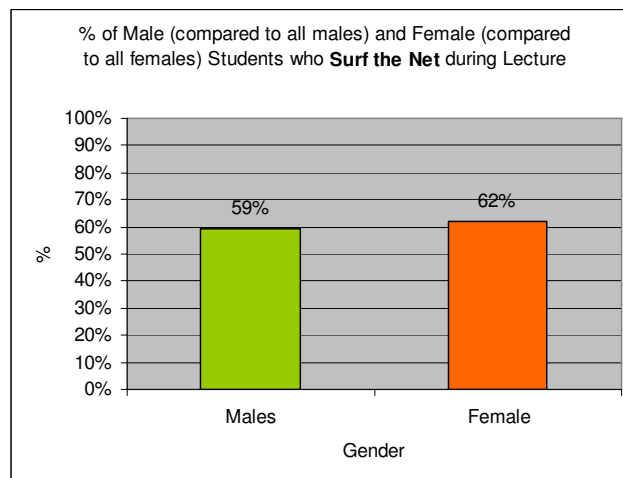


Fig. 8

Figure nine describes the participant's computer gaming habits during lecture. Playing computer games requires the use of a Smart phone and/or computer. It requires concentration and most often the use of both hands. Using a keyboard and/or mouse simultaneously, the user is required to interact with a user interface (game) which is displayed on a screen/monitor. Those who reported playing games during lecture represent 26% of the study's population. During lecture 22% of males are playing games while 29% of females are playing games (fig. 9).

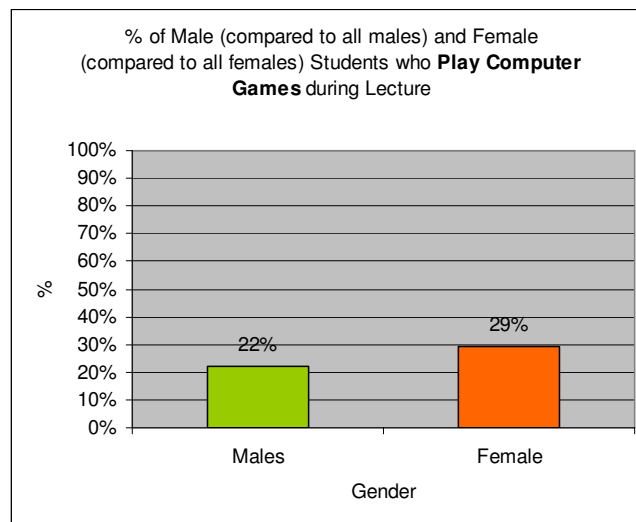


Fig. 9

Figures 10 through 12 indicate participants who reported that they used technology during lecture to multitask *once in a while or often* but not *all the time*: listen to Ipod/MP3, talk on cellular phone and gamble on-line.

Figure ten describes the participant's habits about listening to an IPOD during lecture. Listening to an IPOD/Mp3 player requires the use of a player or computer. Listening to this device occurs most often with one or both earphones in the ears. Participants listening to an IPOD represent 12% of the study's population. During lecture

19% of males are listening to an IPOD and 6% of females are listening to an IPOD (fig. 10).

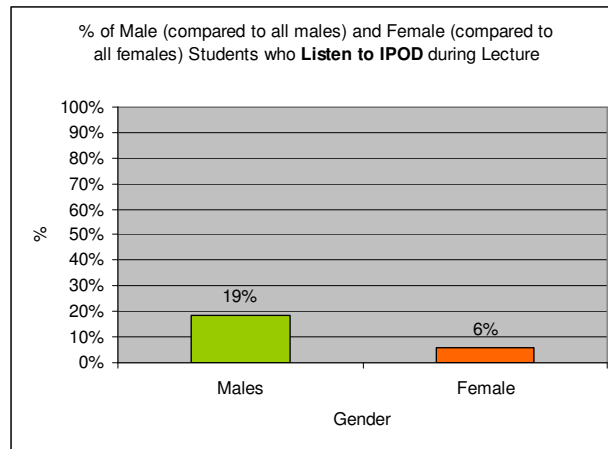


Fig. 10

Figure eleven describes the participant's habits about talking on a cell phone during lecture. Talking on a cell phone requires the use of a cell phone or a computer (Skype). Talking on a cell phone requires the user to engage in a conversation, listen and respond. Participants talking on a cell phone represent 5% of the study's population. During lecture 3% of males are talking on a cell phone and 6% of females are talking on a cell phone (fig. 11).

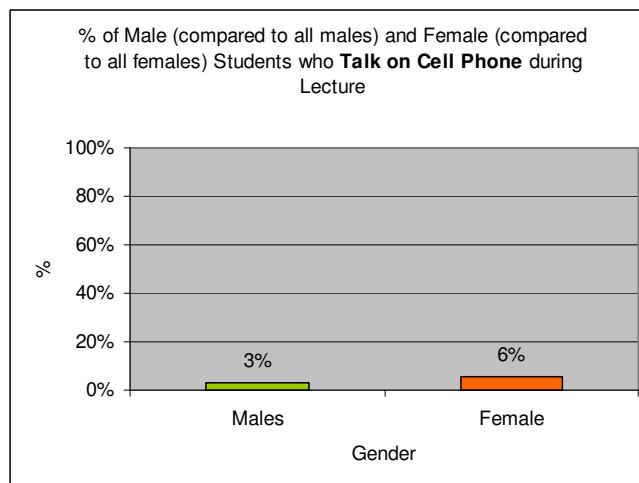


Fig. 11

Figure twelve describes the participant's habits about on-line gambling during lecture. On-line gambling requires the use of a Smart phone or a computer. On-line gambling requires the user to engage in a game such as poker and interact with the game. Participants on-line gambling represent 3% of the study's population. During lecture 3% of males are on-line gambling and 3% of females are on-line gambling (fig. 12).

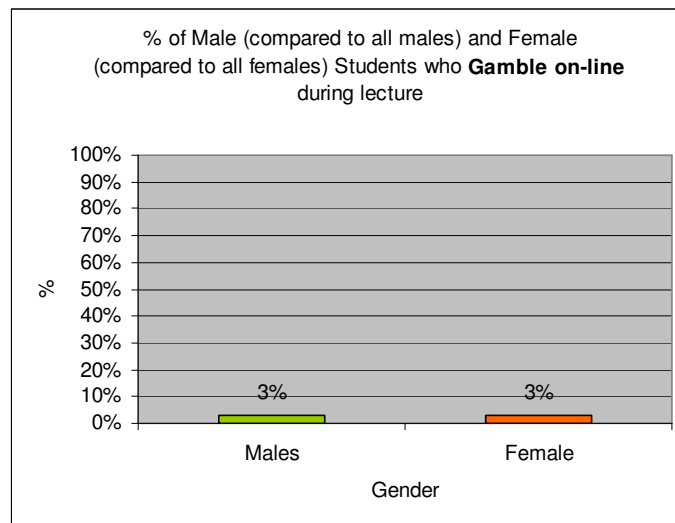


Fig. 12

Multitasking and Student Grades

Collectively, the above findings demonstrate that the majority of students are multitasking with leisure activities such as technology and/or social media while attending lecture. The question remains the extent to which multitasking has an impact on grades. As indicated in Table 1, the average grade for the target course of the participants in the study was 73.6%. The average grade for the target course for participants who did not engage in any multitasking activities while attending the course lecture was 71.0% (Table 2). Finally, the average grade for the target course for participants who engaged in one or more multitasking activities while attending lecture was 73.9%. The difference between those who engaged in multitasking during lecture and those who did not is

almost three full percentage points (2.9%). The average mark is lower for those who claimed to engage in zero multitasking activities during lecture. Therefore, one might argue that multitasking during lecture with more than one activity does not have a negative impact on the average grade for multitaskers. In the case of the lower grade for those who report zero multitasking during lecture, perhaps other sociological factors not investigated as part of this study could account for this result.

Average grade (Target Course) of participants	
Male	74.6
Female	72.6
Total	73.6

Table 1

Average grade (Target Course) of participants who indicate that they do zero activities during lecture	
Male	72.0
Female	69.7
Total	71.0

Table 2

Average grade (Target Course) of participants who indicate that they do one or more activities during lecture	
Male	75.0
Female	72.9
Total	73.9

Table 3

The next two graphs indicate a slightly different story about grades and multitasking. Figure 13 shows a downward trend in grades. As participants increase the number of tasks/activities occurring simultaneously while attending lecture, the lower their grade in the core course. For example, the results showed that participants multitasking with one activity during lecture achieved a higher grade than those multitasking with more than one activity. However, grades remained fairly constant and at an average level when two to four leisure activities occurred while attending lecture.

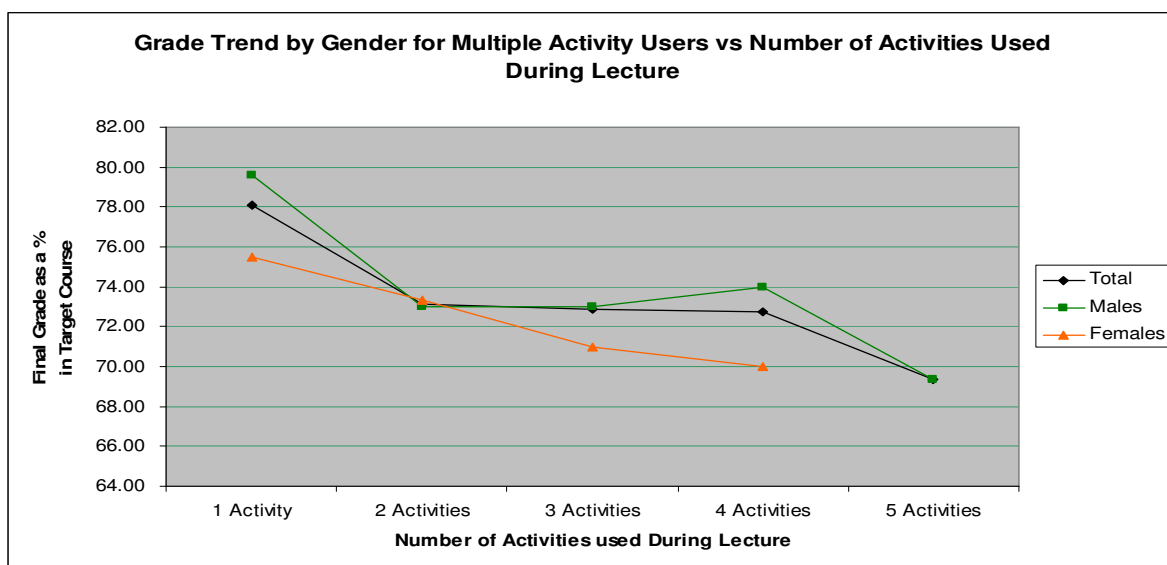


Fig. 13

Figure 14 shows a surprisingly similar trend. When participants engage in one to three simultaneous activities during lecture, there is minimal change in the core course grade for the total population as well as for the males when compared to their overall self-reported average grade at the end of their final year of high school. The result for females differed significantly from the other two groups when adding a second multitasking leisure activity. The trend for females indicates that when a second activity is added, the grade in the core course improves as compared to the overall self-reported average grade for females in their final year of high school. For all participants, when multitasking activities occurring simultaneously during lecture increase beyond three, the difference in the core course grade increases when compared to their self-reported average grade in their final year of high school.

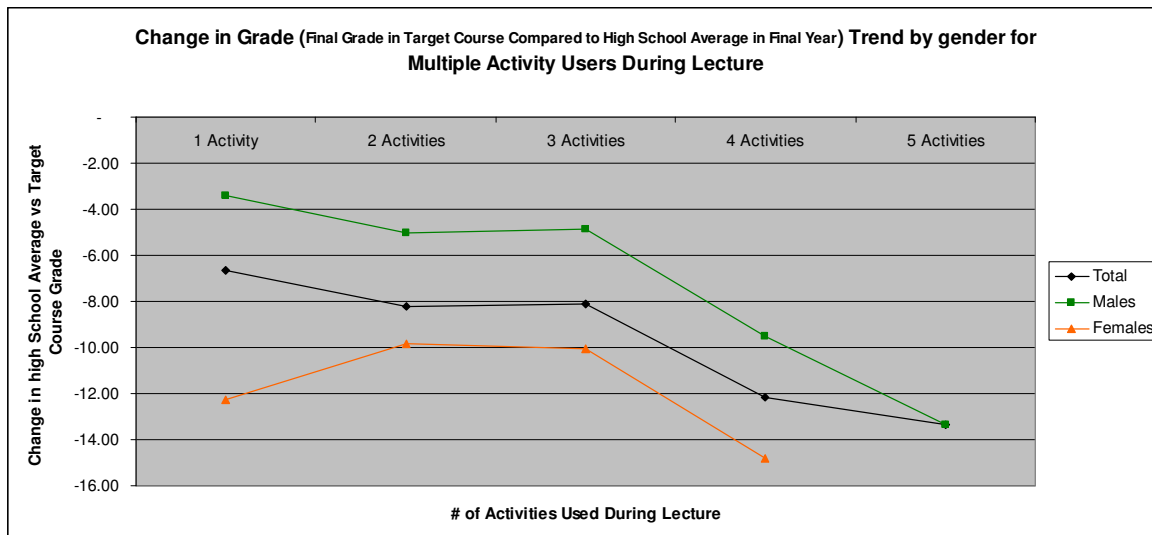


Fig. 14

Productivity

Table 4 is revealing. This table shows that 81% of the participants in the study believed that they would be less productive during lecture if they were allowed to multitask with the activities listed as part of this study (e.g. talk on cellular phone, text,

surf the internet, play computer games, listen to Ipod/MP3, use social networks such as Facebook). It is ironic that the majority of the students believe themselves to be less productive during lecture, yet in spite of that attitude, 89% of the participants engaged in these very activities during lecture (see Table 4). According to the survey, there was not a significant impact on their grade until a certain threshold.

#16 During lecture, do you think students would be more productive if they were allowed to do any of the activities listed (e.g. Talk on Cellular Phone, Text, Surf the Net, Play Computer Games, Gamble On-Line, Listen to IPod, Use Social Network Sites (e.g. Facebook)?			
	Yes	No	Total
Male	10.7%	89.3%	100.0%
Female	26.7%	73.3%	100.0%
Total	19.0%	81.0%	100.0%

Table 4

Multitasking and Work

When participants were asked about social networking (e.g. Facebook, Instant Messaging etc.) and its use for non-work related activities during work hours, both males and females overwhelmingly responded that they did not expect to be able to use social networking for personal purposes during work (fig. 15). However, females reported a higher 'yes' response at 18% than did males who reported 13%. This is perhaps due to the females in this study reporting to be the higher users of social media generally (indicated in fig. 6) or the type of job they expect to work at.

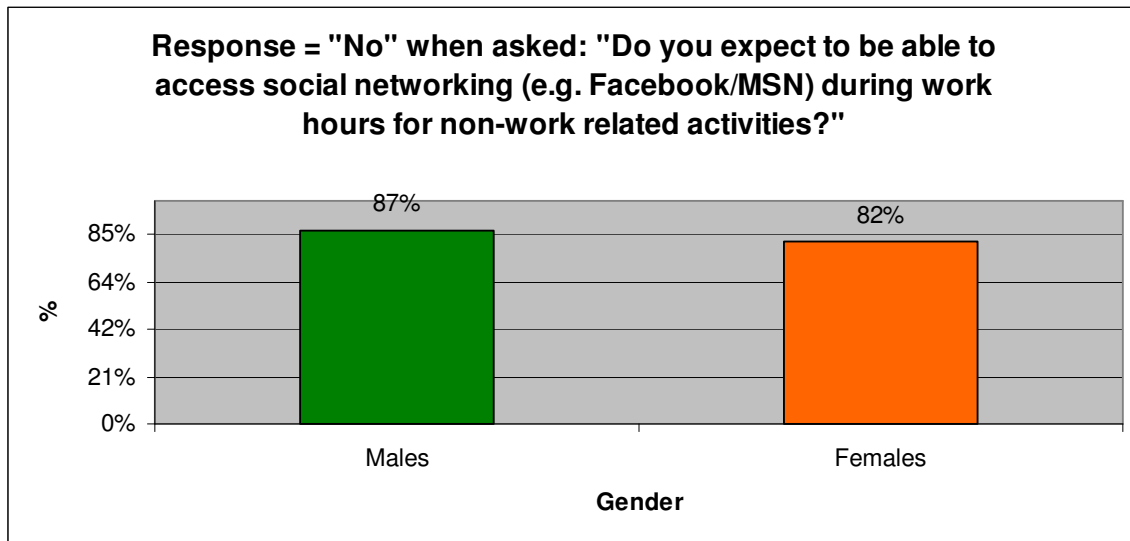


Fig. 15

When participants were asked about personal electronic devices (e.g. personal cell phone, iPad, iPod etc.) and their use for non-work related activities during work hours, the majority of both males and females responded that they did not expect to be able to use personal electronic devices for personal purposes during work (fig. 16). Both males and females reported equally a 'No' response. A possible explanation for this is the increased use of cell phones generally.

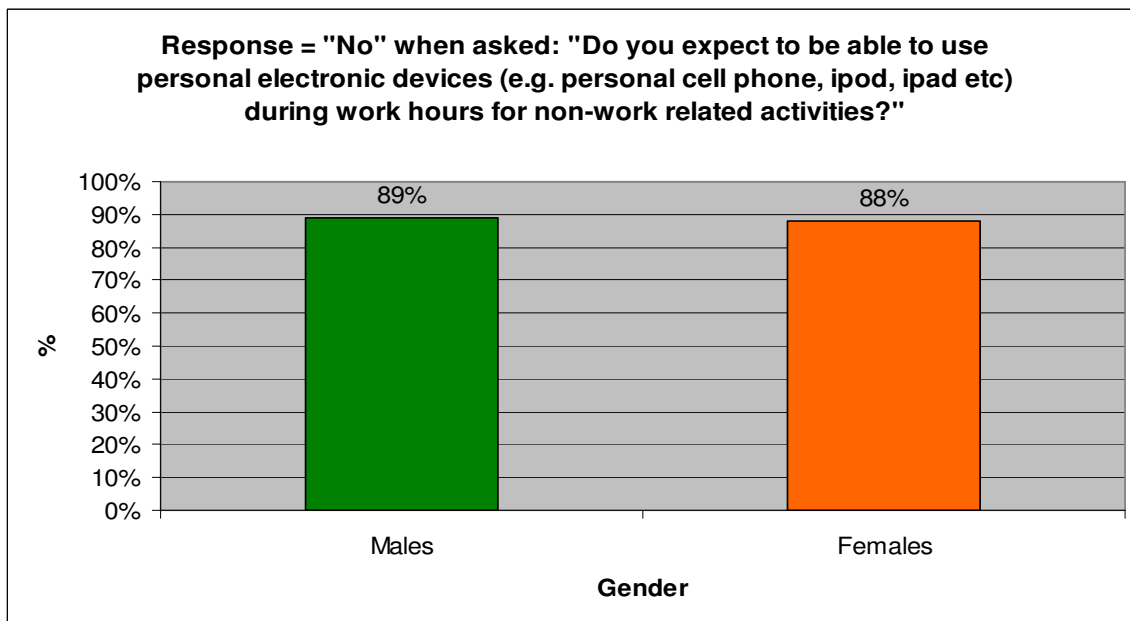


Fig. 16

Discussion

Research Question

RQ: How does multitasking affect student grades and what is the relationship between time discipline and multitasking and student grades.

The results of this study suggest some emerging issues regarding the use of technology and/or social media for leisure purposes in the classroom during lecture. First, time discipline is as much a control of ‘production’ in the classroom as it is in the industrial workplace where mono-tasking was used by capitalists as an unnatural tactic to attempt to control production. Indeed, if not an attempt to control production, it was an attempt to raise production to as close to 100% output as possible. Second, we have a rising generation that is universally comfortable with the constant stream of interruptions and diversions during lecture, challenging the attention spans and the use of lecture time of many. The classroom is one of those social situations heavily controlled by social norms. The reason for this may be obvious; however, the norms in the classroom and the attitudes about diversions and time merit examination.

In this study, actions about diversion-use during lectures contradict students’ beliefs about productivity; yet, their grades appear to be unaffected until a certain threshold. Research shows that this type of occurrence is not uncommon. For example this study showed that about one fifth of the participants believed that students would be more productive during lecture if they were allowed to do various activities such as text, surf, talk on cellular phone/Blackberry, play computer games etc. The Pew Internet and American Life project released a study that showed one-third of college students play video games on their laptops during class, reporting that it did not affect their academic performance (Jones, 2003). Moreover, this study reported that a significant number

(26%) of the participants play video games during lecture. If one believes that ‘production’ does not have to be at one hundred percent capacity, then the blending of leisure time and work time in this case supports E.P. Thompson’s argument that there is no conflict and therefore no need for demarcation between work time and leisure time during lecture.

The classroom is a very public space with little privacy. Therefore diversions may be more of an intrusion. In addition, lecture halls/classes are often collectively focused gatherings where a monotasking/single event (e.g. learning) is supposed to be taking place. According to Goffman (1963), during a collective-focus event “participants turn their minds to the same subject matter” (p. 89) thus, private diversions, such as 89% of the class using technology to multitask for leisure during a time that should be allocated to work purposes, puts strain on what is supposed to be a collective-focus event. This can become acceptable to the multitasker, a distraction to the instructor and other students, poor use of lecture time and has the potential to drastically change the classroom norms.

In addition, presumably the classroom experience should be influential to the learning experience. In a mono-tasking learning environment, such as lecturing, it requires the learning to be mediated by the classroom where the potential to learn is perhaps at stake when multitasking with leisure activities in significantly high numbers is occurring during lecture. Some believe that multitasking for leisure purposes with technology/social media while learning is impossible. For example, Thomas Sherman, professor of education at Virginia Tech, as cited in Gilroy (2004), suggests:

Anyone who believes playing a game during class will not harm learning is living in a fantasyland...human beings are not able to concentrate on two things at once, especially when one of them, either the game or the class content, is quite difficult (p. 59).

However, researchers claim the risk is in developing brains that are more easily habituated to constantly switching tasks and less able to sustain attention. For example according to a study prepared for The Kaiser Family Foundation (Schmidt et al, 2010)

Their [childrens'] brains are rewarded not for staying on task but for jumping to the next thing...the worry is we're raising a generation of kids whose brains are going to be wired differently (p. 1).

Yet, as instructors ignore optimum learning environments such as those presented by Chickering and Gamson and remain tied to a mono-tasking, lecture-style learning paradigm, where every moment is an instructor-led teachable moment, then students may choose to work in a more autonomous environment of their own making one that includes both work and leisure as in the preindustrial workplace and is occurring in the classroom today.

This phenomenon is not only occurring in the classroom setting. Neuroscientists have been studying young people in order to understand what happens to those who are constantly on-line. Another study published by The Kaiser Family Foundation found that half of students are using the internet, watching TV or using some other form of technology/media either “most” or “some” of the time while they are doing homework (Rideout, Ulla, Foehr and Roberts, 2010, p.24). Researchers have found that these multitasking activities which could be over-stimulating the brain, led to lower sleep quality and inability to remember vocabulary words (Dworak, Schierl, Bruns, and Struder, 2007, p.978), which in turn may have an impact on students' grades. Therefore, multitasking activities causing over-stimulation of the brain may account for the lower grade for those who report *never* when asked if they do other activities during lecture. Indeed, one must decide what production capacity is an acceptable standard (if grades

(output) are the assumed measurement of production) and how time and the amount of time should be allocated to achieving the standard.

Solutions

Research suggests (Ling, 2004) that for adults in their early twenties technology is an extremely important tool for connection to one's social network; therefore, it is plausible that the important role technology plays in the lives of young people contributes to their tolerant attitudes about technology and its use as a leisure activity in the classroom during lectures. Engestrom's activity theory offers alternatives to restrictive methods of controlling production in the classroom. The alternatives could incorporate technology/social media (the tools) while meeting the needs of the learners (the subject), the instructor and the community (the divisions of labour) within the context (the rule) of a new learning paradigm (the object).

Tool

Rather than outright banning and/or eliminating the tools such as computers and Smart phones from the classroom, filtering tools can be used in the classroom in order to filter out distracting websites during class, but allow other websites that the students may use for instructor-assigned computer activities. Respondus LockDown Browser is a tool that Northeastern University uses to lock down the ability to navigate to other websites during instructor-assigned computer assisted activities (Northwestern University, 2010). The flip side of computer assisted activities in the classroom is that not all students have laptops for this purpose.

Another tool commonly used in most Canadian universities (McMaster, Manitoba, UBC) is the iClicker. Combined with the Quest Learning and Assessment web-based tool for instructors and students, instructors can create homework, quizzes and

exams from a large pool of questions with built-in variations (Quest, 2008). In addition, Quest can create custom assignments for each student. Students get immediate feedback when answering questions during class and can view step-by-step solutions after the assignment due date has passed (Quest, 2008). The Quest system includes a utility to enable student submission of answers in class using the iClicker Audience Response System and have the results uploaded for the class to review (Quest, 2008). The Quest utility also allows test answer submission via the iClickers instead of scan sheets (Quest, 2008).

The McMaster Social Science Faculty has launched a new student-centered application optimized for the iPod Touch and the Apple iPhone. According to McMaster's email broadcast:

The “app” facilitates access to several central resources but revolves specifically around raising the profile of Social Sciences resources, opportunities, activities, news, social media, video and important events as they may pertain to a student studying in our faculty (2011).

When viewing the new “app” one student commented, “this has influenced me to buy an iPhone...shared this on twitter” (McMaster-YouTube application comments, 2011)

Initiatives such as those described above would incorporate many of the principles for good practice in the classroom while allowing the students to engage in their own learning while incorporating tools into the classroom.

Division of Labour

Incorporating technology into the classrooms is often fraught with unreliable technologies and/or simply a lack of knowledge on the part of the instructor. In such cases, technology enhanced classrooms can be managed collaboratively between students, instructors and technology experts on site. These teams can work together to

ensure that the technology is operating at an optimum. For example, in the McMaster university psychology department, Joe Kim participates as part of a Pedagogy Research Lab, with a development team designed to “use a unique blended learning environment combining leading learning-technology with traditional face-to-face instruction” (Kim, 2011).

A division of labour such as this is optimum, but requires technological sophistication, time and resources on the part of the institution, the instructors, the advisors, the technology team and the students. However, it is well worth the effort as students are able to manage their own time, participate in their own learning experience, and engage with the technology and/or face-to-face instruction that suit them best. Instructors are able to incorporate a multitude of learning paradigms that appeal to visual, auditory, sensory etc learners while meeting the optimum requirements for good teaching practices as described by Chickering and Gamson above.

Rule

An option for setting allowable boundaries for technology in the classroom is for instructors to work with the students on a faculty by faculty basis to come up with departmental policies for use. Once the policies are adopted they can be included as part of the syllabus to remind students of the appropriate use of leisure activities during lecture.

This option of involving students ensures that policies are collaborative between both parties in order to elicit self-regulation. Moreover, this supports the shift to student's involvement in the learning process rather than a paradigm where the onus for learning is solely on the instructor. And finally, where there is a negotiated learning contract, such as

the syllabus, then students may be more likely to participate in the learning outcomes if they see the contract as an element of mutual trust.

Community

Provided that instructors have adopted the previous suggestion about creating collective rules of engagement with regard to technology, instructors can use various instructional methods for educating the community about technology related community norms. In fact, where policies are adopted university-wide, education about such can be combined with and communicated during orientation events. And finally, universities can use their own media outlets for distribution of information. This will educate students about technology in the classroom and hopefully prevent rude technology-related behaviours from occurring.

Object

Another method of engaging the students without focusing on banning the tool is to deconstruct the traditional mono-tasking-type of teaching where students are forced to sit quietly while instructors lecture. There are any number of ideas when it comes to technology and disseminating the course content. Examples range from individual study such as podcasting lecture material to group study such as in-class discussion and/or activities. Rather than a barrier, computers can become a teaching aid for the instructor or with each group of students using a computer; the computer can become a learning aid for students. This type of teaching would appeal to multiple types of learners thereby creating more learning time/diversions rather than leisure time/diversions during lecture.

Subject

A final option to move away from banning the tool is to involve the subjects. One only needs to be an instructor or a teaching assistant for a very short time in order to

recognize that students, once given the opportunity to use technology to make their own presentations, will spend significant active learning time with the technology. Therefore, many new opportunities for learning rather than leisure-diversions unfold.

Students who participate in managing their own time often continue their learning experiences outside the classroom. According to Naismith, Lonsdale, Vavoula and Sharples (2004), the subject is able to personalize their classroom learning opportunity when technology is embedded in the learning paradigm long after the actual class is over (p. 33). However this type of learning and use of time is only effective when students have access to the tools e.g. computer, Smart phone. On the positive side, the collaborative nature involving the subject can be used to motivate disengaged or at-risk students to improve their use of time.

Activity theory therefore offers a numbers of choices when faced with the need for universities to broaden the scope of instructional methods. This has the potential to transform the tool from one that is often considered a diversion to one that is employed productively within and beyond the classroom.

Implications

There are implications for users, instructors and many others associated with this form of teaching and learning when an activity-based learning paradigm is being used in the classroom. For the user and the institution there are cost factors to consider.

Incorporating technology/learning tools into the curriculum can create a divide unless all students are supplied with the technology/learning tool. Those who are unable to afford the technology may not be able to participate fully. In addition, as technology improves

daily, students may not be able to keep up with the constant stream of new technologies available, thus excluding them from the opportunity to learn.

There are also significant costs for the university. There are training costs for the instructors, additional hiring costs for more technologically-savvy support staff, and significant initial capital costs to equip and maintain a networked institution. Moreover, the decision-making for a pedagogical approach such as this requires months of deliberation, thereby rendering certain technologies obsolete at implementation time. There are benefits to this expenditure as universities that offer activity/tool-based learning, may have a competitive edge over other institutions. For example the ability to provide applications which would allow for immediate feedback is something that students are currently used to in their social networks.

A second implication to incorporating the technology in the classroom is that some instructors may have little or no interest in reforming their teaching practices. In addition, not incorporating technology into the learning and learning paradigms could create a negative perception of the course or the instructor. For example students may perceive the instructor as someone who resists positive change.

A third implication is privacy. This includes privacy for both the instructor and the student. On the positive side, technology can be used to maintain accurate details about individual students to help draw out their individual or specific needs. However, technology can be manipulated for inappropriate use violating privacy and context rules with serious consequences.

Limitations of this Study

It is important to emphasize that this study simply provides evidence for the trends in the findings and does not prove them. This is merely exploratory research. The size and nature of the sample hinder the ability to infer the findings to the student population in general and future research should aim at a wider sample. Although this was a modest study, the results point to some areas that would be interesting to further investigate. For example, comparing classes where personal technology is banned and where it is incorporated. It would be interesting to further investigate faculty and student attitudes and behaviours about technology in the classroom as well as to compare a larger sample size for those who report they do not multitask during lecture. In addition, an improved method for measuring grades and technology-use would enhance this study. Access to all grades rather than only the grade of one course and a self-reported high-school average grade would have further enhanced this study. Other measuring sticks for success in the course would improve this study. Grades are neither a good nor the only indication of learning. In order to accept this, one would have to accept that a good grade means that the student learned something when in fact that may not have been the case.

Rather than imposing restrictions on the use of technology such as computers and Smart phones in the classroom, it may be tempting to seek new solutions to address the challenges highlighted in this study. Moreover, it is important not to lose sight of the potential for incorporating these diversion devices for constructive use in an educational context. For example texting would be a welcome improvement over socializing and loud chatter in university libraries; often used as a meeting place to work on group projects. The findings in this study provide evidence for policies that would be well supported by

students. Therefore as this topic gains momentum, researchers and policy makers should look further at the problems as well as the educational opportunities.

Conclusion

The results of this study suggest some interesting issues regarding student grades and the tremendous social popularity of technology and social media and its leisure use during lecture with ties to historical roots predating the industrial revolution. Although computers, cell phones and Blackberrys are not welcome for leisure during lectures right now, this study concludes that there is very little effect on student grades when multitasking with leisure activities such as technology/social media during lecture up to a point. Policies regarding the use of such vary from classroom to classroom and university to university. Regulations and policies in many universities are inconsistent and left to grassroots initiatives. As trends in mobile technology become more ubiquitous and networked, media devices will likely merge to provide a single multimedia device that is always with you—even in the classroom. This may mean that educational practice may be forced into including these devices in productive ways. More concerted and consistent policy-making is needed in order to help build and incorporate technology and new methods of instruction that appeal to the way students want to learn in the classroom.

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Appendix

Survey of Multitasking Habits in First Year Social Science Courses

1. What year of university are you currently in? (circle only one below)
a. First year b. Second year c. Third year d. Fourth year
2. What is your age? _____ years old
3. What university faculty are you in (e.g. Social Science, Humanities)? _____
4. What university department are you in (e.g. Anthropology, Sociology)?

5. What is your sex? (circle only one below)
a. Male b. Female
6. What is your student number? _____
7. Please estimate your family's gross annual household income
a. Less than \$15,000
b. \$15,000 to \$29,999
c. \$30,000 to \$49,000
d. \$50,000 to \$75,000
e. \$75,000 to \$99,999
f. \$100,000 or more
g. Don't know
8. What was your average in your last year of high school? _____%
9. During lecture what is your usual method of taking in the information presented (circle all that apply)?
a. I don't take lecture notes
b. I write my notes by hand
c. I type my notes on a laptop computer
d. I record the lecture
e. I receive the notes from the Centre for Student Development
f. Other _____
10. How many hours of lectures have you missed for this class since school started in September?
a. I have not missed any lectures
b. 1 to 3 hours missed
c. 3 to 5 hours missed
d. More than 5 hours missed
11. Using the choices below, circle the one that best describes your use of social media (e.g. Facebook/MSN):
a. I do not use any social media
b. 1 to 3 hours per week
c. 3 to 5 hours per week
d. 5 to 10 hours per week
e. More than 10 hours per week
12. If and when you take a paid job, or if you have a paid job now, do you expect to be able to access social networking (e.g. facebook/MSN) during work hours for non-work related activities?
a. Yes b. No

13. If and when you take a paid job, or if you have a paid job now, do you expect to be able to use personal electronic devices (e.g. personal cell phone, Ipad, Ipad etc.) during work hours for non-work related activities?
 a. Yes b. No
14. Since the beginning of this school year (September 2010) for each of the activities, put an X in the box that best describes your frequency in engaging in the activities during lecture for **THIS COURSE**:

ACTIVITY > >	During Lecture I Talk on Cell Phone	During Lecture I Text with Cell Phone	During Lecture I Surf the Net	During Lecture I Play Computer Games	During Lecture I Play On-Line Gambling	During Lecture I Listen to my IPOD/mp3	During Lecture I Use Social Network Sites e.g. (Facebook/MSN)
Once in a while							
Often							
All the time							
Never							

15. During lecture, should students be allowed to do any of the above listed items in question #14 above (e.g. text, use facebook, surf the net etc.)?
 a. Yes b. No
 i. If you circled Yes, circle Yes or No (below) to indicate which ones should be allowed:
- | | | |
|--|-----|----|
| 1. Talk on cell phone | Yes | No |
| 2. Text with a cell phone | Yes | No |
| 3. Surf the Net | Yes | No |
| 4. Play any type of computer game | Yes | No |
| 5. Play on-line gambling | Yes | No |
| 6. Listen to Ipad/mp3 player | Yes | No |
| 7. Use a social network e.g. Facebook, MSN | Yes | No |
16. During lecture, do you think students would be more productive if they were allowed to do any of the activities listed in question #14 above? (e.g. text, use facebook, surf the net etc.)
 a. Yes b. No
 i. If you circled Yes, circle Yes or No (below) to indicate which ones would help students to be more productive during lecture:
- | | | |
|--|-----|----|
| 1. Talk on cell phone | Yes | No |
| 2. Text with a cell phone | Yes | No |
| 3. Surf the Net | Yes | No |
| 4. Play any type of computer game | Yes | No |
| 5. Play on-line gambling | Yes | No |
| 6. Listen to Ipad/mp3 player | Yes | No |
| 7. Use a social network e.g. Facebook, MSN | Yes | No |

THANK YOU FOR COMPLETING THIS SURVEY!